

Conceptual Work Plan Citizen's Gas & Electric Company Site

Citizens Gas & Electric	
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This conceptual work plan was developed to guide the implementation of the recommendations in the Phase II Investigation Report. Those recommendations included:

- Supplemental groundwater investigation.
- Surface soil investigation.
- Risk assessment.



Groundwater

The supplemental groundwater investigation includes characterizing the groundwater downgradient of the site, adding an upgradient monitoring well, and placing a deep coarse alluvial aquifer monitoring well.

Previous investigations have found visible oil presence in the coarse alluvial unit to the downgradient (southwest) side of the former gas holders and tar pit. NAPL was found at monitoring well MW-3 on the west portion of the site. On the east portion of the site, the pilot boring (SB-20) for monitoring well MW-7 showed this location was unsuitable for a monitoring well due to the presence of oiliness in the upper portion of the coarse alluvial aquifer. Nevertheless, the Phase II investigation found no evident impact from the site on the groundwater sample from monitoring well MW-8, only 300 feet downgradient of the former tar pit. MW-8 is only 220 feet downgradient of monitoring well MW-3 where NAPL was found.

In order to better characterize the plumes downgradient of the site, groundwater screening samples will be collected from a series of temporary sample points placed south of the railroad tracks as illustrated on Figure 1. The samples will be collected with a temporary groundwater sampling point method such as geoprobe or hydropunch. The samples will be screened for BETX, which are the mobile contaminants often associated with coal tar contamination. The samples will also be fingerprinted for petroleum hydrocarbons in order to help distinguish between potential sources.

The area south of the site is the location of former petroleum storage and processing facilities. There are potential impacts to the soil and groundwater from these facilities. The presence of

contamination in the zone above the coarse alluvial aquifer could compromise the groundwater screening samples. Therefore, the shallow soils will be screened with field tests such as odor, headspace, and sheen tests before penetrating to the coarse alluvium. If there is evident or obvious shallow contamination, the groundwater screening will not be completed at that location.

Based on the results of the groundwater screening, two monitoring wells will be placed downgradient of the site. One monitoring well will be placed downgradient of the east side of the site. Another monitoring well will be placed between monitoring wells MW-3 and MW-8, downgradient of the west side of the site, to assist in evaluating attenuation of the plume expected downgradient of monitoring well MW-3.

Upgradient of the site, groundwater screening will be used to select a location for a monitoring well upgradient of the west portion of the site. This well will help in assessing potential impacts on the groundwater at the site from any upgradient sources.

One monitoring well will be placed to investigate the quality of the groundwater downgradient of the site at the base of the coarse alluvial aquifer. It is expected that groundwater flow directions are similar throughout the depth of the coarse alluvial aquifer, since the coarse alluvium is continuous with no evident horizontal confining units. Therefore, the well should be located southwest of the most likely source area. The most likely source of groundwater contamination in the deep zone is the former tar pit area. The evidence of soil boring SB-15, ST-5, and monitoring well MW-3 suggest that if contaminated groundwater is likely to be present in the deep portion of the coarse alluvial aquifer, it would be expected downgradient of the former tar pit. Therefore, the deep monitoring well will be placed adjacent to monitoring well MW-8. If manufactured gas plant contaminants are found in the deep monitoring well, the issue of deep groundwater contamination will require further examination.

Surface Soil

Large portions of the site are covered by asphalt, gravel, concrete, and buildings. In areas not covered, three samples from the 0 to 2.5 foot interval were reported to have carcinogenic PAHs at concentrations greater than 75 mg/kg.

In order to achieve better characterization of the surface soil in the three areas not covered by buildings, pavement, or gravel, a different approach to surface soil sampling than was used in the

Phase II investigation is proposed. Soil samples will be collected to be representative of an area rather than of a single point. Soil samples will be collected from the upper six inches of the soil rather than the upper 2.5 feet. Six inches is a reasonable depth for potential casual exposure to soils through direct contact or dust generation. The surface characterization would be done for the three areas with carcinogenic PAHs above 75 mg/kg at borings SB-18, SB-19, and SB-24. Two additional areas may also be sampled, if these areas are not gravel-surfaced. One area is by monitoring well MW-4. The other area is beneath the highway, not in the immediate vicinity of a former gas holder.

In order to produce samples representative of an area rather than a point, each surface soil sampling location will be a 30-foot by 30-foot area. The surface soil sample will be a composite of aliquots collected on a grid within the area.

Risk Assessment

The risk assessment is designed to evaluate the risk to human health and the environment represented by the identified contaminants at the site. The assessment will evaluate risks associated with exposure to contaminated soils and groundwater. The results will be used to: (1) develop appropriate cleanup standards for the site, and (2) to guide selection of appropriate remedial measures for the soil and groundwater. Risk assessment information for soils will also be used to help interpret the Phase I and Phase II investigation soil data. This information will be used in determining the appropriate scope of future additional soil investigation at the site.

The risk analysis will evaluate exposure to surface soils and subsurface soils. The surficial soil pathway will include soils at depths 0 to 0.5 feet in areas that are not paved, covered by buildings, or gravel-surfaced. This depth interval was selected to be representative of plausible exposures (i.e., inhalation of contaminated dust, and incidental exposure to the ground surface soils).

Subsurface soil pathway will include exposure to soils at depths of 0.5 to 6 feet. These depths were selected to be representative of typical utility construction activities. Below 6 feet, contamination in the soil will be considered as it relates to impacts on groundwater.

The groundwater pathway evaluation will be based on current uses of the groundwater in the coarse alluvial aquifer and potential future uses based on potential groundwater development in

accordance with State of Iowa and City of Council Bluffs, regulations, ordinances, standards, and policies.

Reporting

The supplemental groundwater investigation results will be summarized in a brief report. The report will be considered supplemental to the Phase II investigation report, and will focus on groundwater data presentation and evaluation.

The risk assessment will be supplied in a separate document. The risk assessment will consider both the risk associated with the site and development of potential cleanup standards for the soil and groundwater at the site.

